

An Inventory of Agricultural Water Technologies and Practices in SWAZILAND

I. GENERAL	Technology 1=Commercial drip	Technology 2 =name	Technology 3 = name	Technology 4 = name	Technology 5 = name	Technology 6 = name	Technology 7 = name
1. Name of water technology or practice	Dripper lines (Sugarcane Outgrower schemes)	Semi-portable sprinkler (Communal schemes)	Direct applicator hose-pipe.	?	?	?	?
1.0 Detailed description of technology or practice (give technical description, refer to Annexes 1 & 2; attach an illustration/picture if technology is not in the lists)	Dripper lines or 6 - 12 mm dia are laid in the ground with perforation to supply water directly to the crop through emitters.. Line spacing is crop dependent.	Water is pumped from the river to the point of application. The supply lines have a fixed position and buried in the ground whilst the laterals from which the sprinklers are connected are laid on the ground surface and can be moved from one position to another.	A hose-pipe is fitted into a risomatic stand on gravity pressured pipes. When a hose pipe is inserted into the risomatic stand it pushes a ball valve system down thus opening the pipe and allow water to flow into the hosepipe. When the hosepipe is removed the valve shuts and flow is stopped.				
1.1 Source of technology (Indigenous or Imported)	Imported	Imported	Indegenous				
1.2 If imported, any modifications done (Yes or No)	No	No	Yes. The design assembles gadgets from different systems to come up with a unique device.				
1.3 Provider of technology ^b	Commercial firms	Local agents , NGOs and government	Government, Ministry of Agriculture				
1.4 Who developed/designed the technology package ^c		Designed and packaged in South Africa	Ministry of agriculture				
1.5 Who installed the technology package ^c	Sugar companies (e.g. RSSC)	Normally done by the Ministry of Agriculture .	Ministry of agriculture				
1.6 Source of water (surface, groundwater, harvested rainwater, wastewater, etc.)	Surface	Surface water, mostly run of river abstractions	Run of river (surface)				
1.7 Is the technology used for more than one use (multiple uses)? (Yes/No)	No	No, Only used for irrigation	No				
1.8 If yes, what are they?	N/A	na	N/A				
1.9 If yes, how is the technical design adapted compared to the design for single use?	N/A	na	N/A				
1.10 What is seen as advantages of multiple use systems as compared to the design for one single use?	N/A	na					
1.11 What are the disadvantages of multiple use systems?	N/A	na					
2. Specific location/address & distance from main urban center (km)	Varies but most schemes in the low veld in and around sugar estates	The systems are promoted in the middle and high velds were river flow is almost perenial.	on the highway to Mancini				
3. Main source(s) of income in site	Sugar ane	Marketing of farm produce	Vegetables (cabbages, carrots, tomatoes, etc)				
4. Other source(s) of income in site	Formal jobs elsewhere	none	money from husbands who work elsewhere				
5. Type of user (community or individual households)		Community group (malwe dominated)	only women and children (but not necessarily from poor families)				
6. No. of benefitted households; average size of households	difficult to determine as benefits are to scheme owners, their workers and supporting services such as vendors.	10 to 20 households are reported to be served by one scheme. Households sizes range between 6 and 10 people.	Over 60 households. Household size is between 6 and 10 people.				
7. Total size for all beneficiaries (ha) -note average size per beneficiary	50 - 100 ha per scheme. (the total area in Swaziland could not be ascertained)	Schemes are operated communally and the proceeds shared equally.	scheme size = 30 ha				
8. Profile of beneficiaries (if mostly ultra poor, poor, non-poor or mixed) ^a	Mixed, usually closest to the estates and willing to participate.	mixed. Scheme location is determined more by the availability of water (and funds) than by socio-economic status of the beneficiaries.	mostly poor women				
8.1 Was project/program area selected based on available data on comparative incidence of poverty? (Yes/No)	No. (It was more the desire of estates to reduce operational costs!)	No	NO				
8.2 If yes, indicate the poverty status of the project area relative to all other regions of the country	n/a	Difficult to determine	na				
8.3 Were particular populations or groups targeted within the project area (e.g., based on baseline socioeconomic surveys or participatory poverty assessment, etc)? (Yes/No)	no	no	women ended up working on the scheme because the mae refused to be part of the scheme.				
8.4 If yes, indicate the poverty status of the beneficiaries relative to the non-beneficiaries in the project/programme area	n/a	na	there isn't much difference				
8.5 Indicate the proportion of women beneficiaries	Registered participants are usually male though may be responsible for day to day operatuions.	Ownership is usually by the male (who is registered) but field work is done jointly	100%				
9. Month & year technology was introduced	Outgrower schemes gained momentum in the late 1990s	Since the late 1980s	Since 1999				
10. No. of years of adoption	Around 5 yrs	over 20 yrs	about 6 years				
11. Is technology still in use (Yes or No)	Yes	Yes	Yes				
12. If not anymore, why? (STOP here for this technology)	N/A		N/A				
13. Type of technology (water capture such as small dams, rainwater harvesting OR distribution/water use such as treadle pumps, drips, etc.)	small dams and motorised pumps.	Run of river (with diversion works.)	water flows directly from the river into a canal.				

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14. Describe the counterfactual or the old technology (practice) the new water management technology/practice replaces.	Surface furrows	Dry land farming	Surface furrows				
14.1 Is the change partial or complete?	complete	Complete on site (but most families also have dryland plots)	complete				
14.2 If the change is partial, describe the elements of the old system that were preserved and those that were discarded	na	na	na				
II. Profitability of the TECHNOLOGY							
a. The new technology or management practice (Note: prepare an enterprise or partial budget)							
15. What is the estimated and actual life of the technology? (in years)	3 - 7 yrs	Estimated life is about 10 yrs. Actual life ranges between 8 and 15 yrs depending on the O&M	10 - 15 years with good maintainance				
16. Was technology given out for free?	No, Was bought through a loan	Private sector & NGOs (World Vission) provide loans for aquiring the sprinklers and water supply sytem.	Yes				
17. If NOT totally free, what is the capital cost of technology (reference YEAR of cost estimate; separate costs for equipment/tool/parts, pipes for conveyance into farm, installation, water source development)	25 000- 30 000 Rands per hectare	A 10 ha scheme costs E30 000 to develop including pump, main line and pipes.	N/A				
18. Cost of operation & maintenance per ha (indicate what items are included-- cost of pumping in terms of fuel, energy/electricity, labor costs; maintenance and repair costs, etc.)	Energy = E0.37/kWH , Labour = 12 - 17 mandays/ha	Could not be ascertained.	Maintenance is provided by the Ministry of Agriculutre.				
18.1. Does the new technology require more or less labour than the old technology?	Less labour.	more	Less				
19. Crops produced (indicate main crops vs. secondary crops)	Sugar cane. No secondary crops	Cabbages, green maize, tomatoes, green beans	Vegetables (cabbages, carrots, onions, tomatoes, etc)				
20. Changes in crops grown (into what & when) & reason for new crops or switching	N/A		na				
21. Indicate how many croppings per year (1, 2, or 3)	one	3	2 - 3				
22. Increase in production (in kg/ha) due to technology (including amount used for own consumption & amount sold to market)	not evaluated	produce is for the nearby towns and export as far as the UK.	not assesed				
22. Increase in revenues (in local currency) due to technology (less amount used for own consumption)	not evaluated	A scheme can realise E40 000 per ha per crop. The money is shared equally among members.	not assessed				
23. Estimated & actual financial profits (gross revenues-costs of all cash inputs)	not evaluated	Schem profits can be as high as E20 000 per ha per crop	na				
b. Old water management technology or practice (prepare an enterprise budget) LEAVE OUT QUESTION 24-29 IF NO OLD TECHNOLOGY WAS REPLACED	The old technology of furrow irrigation was under a different operational set-up	Scheme members often have dry land fields in addition to the irrigated land.	Surface furrow irrigation system				
24. What is the estimated and actual life of the technology? (in years)			15-20 years				
25. What is the capital cost of technology?			na				
26. Cost of operation & maintenance per ha (indicate what items are included-- cost of pumping in terms of fuel, energy/electricity, labor costs; maintenance and repair costs, etc.A61)			na				
27. Crops produced (indicate main crops vs. secondary crops)			Vegetables (cabbages, carrots, onions, tomatoes, etc)				
28. Indicate how many croppings per year (1, 2, or 3)			02-Jan				
29. Estimated & actual financial profits (gross revenues-costs of all cash inputs)			not assessed				
III. ROLE OF INSTITUTIONS/ORGANIZATIONS							

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30. Support by NGOs (specify the NGO & indicate if international or local)	None	World Vision (international)	none				
30.1 Indicate the total value of the support (in Dollars or local currency)		not obtained	na				
30.2 Is the support still on-going or withdrawn? (1. Ongoing; 2. Withdrawn)		on-going	na				
30.3 If the institutional support is withdrawn, is the system still functioning?		na	na				
30.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was NGO institutional support? (1. Same pace; 2. Better pace; 3. Slowed down)		na	na				
30.5 Give reasons for the response to 30.4		na	na				
31. Specific support provided ^d		Loans provided for the capital investment.	na				
32. Support by government extension workers & other government agency (specify which agency & whether local or national government) (yes or no)	Yes, both local and national government have provided support through providing advice on farming, management, and there are policies to support the farming initiatives.	Yes. (Ministry of Agriculture)	Ministry of Agriculture				
32.1 Indicate the total value of the support (in Dollars or local currency)	not feasible	na	not quantified				
32.2 Is the support still on-going or withdrawn? (1. Ongoing; 2. Withdrawn)	1	on-going	on-going				
32.3 If the institutional support is withdrawn, is the system still functioning?	na	na	N/A				
32.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was Government institutional support? (1. Same pace; 2. Better pace; 3. Slowed down)	1	na	N/A				
32.5 Give reasons for the response to 32.4	Government support is not a major factor in the out grower schemes	na	N/A				
33. Specific support provided ^d	some extension services	Support is in the form of design and extension services.	N/A				
34. Support by private enterprises (specify enterprise)		Swazi Electricity Cooperation	No				
35. Specific support provided ^d		subsidised electricity	N/A				
36. Support by other organization (specify organization - e.g. community organization) or private sector service provider (e.g. manufacturers/dealers/retailers)	Private sector finance (Enterprise Trust Fund, SwaziBank) + Estates (RSSC)	na	N/A				
36.1 Indicate the total value of the support (in Dollars or local currency)	na	na	N/A				
36.2 Is the support still on-going or withdrawn? (1. Ongoing; 2. Withdrawn)	1. on-going	na	N/A				
36.3 If the institutional support is withdrawn, is the system still functioning?	na	na	N/A				
36.4 If the system is still functioning, is the pace of technology/practice uptake continuing at the same or better pace than when there was institutional support? (1. Same pace; 2. Better pace; 3. Slowed down)	2. Better	na	N/A				
36.5 Give reasons for the response to 36.4	Out grower schemes result in considerable increases in household income	na	N/A				
37. Specific support provided ^d	Land was leased out and the financing houses provided loans	na	N/A				
IV. FACTORS CONTRIBUTING TO PROFITABILITY & SUSTAINABILITY OF TECHNOLOGY (see Annex 3 for sample answers #40-45)							
38. Ease in implementation (Yes & No)	Yes	Yes	Yes				
39. Ease in O&M (Yes & No)	Yes	Yes	Yes, Ministry of Agriculture is provides this service				

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40. Suitability of technology/How adapted to local conditions (well, not so well, etc.)	Well	The system is suitable in areas where water and energy supplies are guaranteed. System may be expensive in most of the rural areas where there is no electricity grid and diesel has to be used.	Ver well adapted to the situation in Swaziland as it requires no energy, allows for precision irrigation and can be adapted for the single user.				
41. Cultural acceptability	Yes	The system is appreciated by the communities that have used it.	Ideal for family as children can be involved.				
42. Effectiveness	Yes	The system has been highly effective in the schemes where it has been used	Compared to furrow irrigation the system is very effective				
42. Environmental impact	not evaluated	The system does not require alterations to topography and some of the water used for irrigation is released back to the river channel from which it was abstracted.	Not assessed				
43. Other advantages (factors contributing to profitability & Suitability)	Management and organisational structures can be specific to the scheme	Since the laterals can be moved from point to point fewer laterals are bought to irrigate the whole scheme thereby reducing capital costs.	Easy management, allows farmers to take turns to irrigate their plots individually, individual water use can be measured.				
44. Other disadvantages (factors constraining profitability & sustainability-- e.g. lack of specific support services or supplies of specific inputs, etc.-- be very specific)	Capacity building initiatives are not taken seriously	Labour is not always sufficiently trained resulting in damage to the laterals and hydrants.	System relies on the run of river and cannot be developed for flat ground.				

KEY:

na = Not Applicable

nil = No information available

^a 1: ultra poor - extremely poor or most vulnerable engaged in rainfed cereal production, no potential to diversify because of lack of land, no livestock, limited available labor, no off-farm incomes/remittances, or without access to land and resources at all 2: poor; 3: non-poor; 4:

^b 1: indigenous knowledge; 2: NGO (specify); 3: government agency/extension worker; 4: private enterprises; 5: other (specify)

^c 1: government agency (extension agency/irrigation advisory services/University); 2: representative/authorized dealers of manufacturers; 3: private consultant; 4: farmers themselves; 5: other (specify)

^d 1: introduction of technology; 2: facilitated access to inputs; 3: facilitated access to output markets; 4: provision of (or facilitated access to) credit; 5: capacity building such as training (specify what); 6: formation of association (specify: water user assoc., producers association,